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09/329,502 06/10/99 MERRILL

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020873
LOCKE LIDDELL & SAPP LLP
ATTN DOROTHY HARRIS
2200 ROSS AVENUE
SUITE 2200
DALLAS TX 75201-6776

IM62/0825

EXAMINER

DANG, T

ART UNIT

PAPER NUMBER

1764

DATE MAILED:

08/25/00

Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks

Office Action Summary

Application No.
09/329,502

Applicant(s)
Merrill et al.

Examiner
Thuan Dang

Group Art Unit
1764



☒ Responsive to communication(s) filed on Jun 5, 2000

☒ This action is **FINAL**.

☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.

A shortened statutory period for response to this action is set to expire three month(s), or thirty days, whichever is longer, from the mailing date of this communication. Failure to respond within the period for response will cause the application to become abandoned. (35 U.S.C. § 133). Extensions of time may be obtained under the provisions of 37 CFR 1.136(a).

Disposition of Claims

☒ Claim(s) 1-13 and 15-21 is/are pending in the application.

Of the above, claim(s) _____ is/are withdrawn from consideration.

☐ Claim(s) _____ is/are allowed.

☒ Claim(s) 1-13 and 15-21 is/are rejected.

☐ Claim(s) _____ is/are objected to.

☐ Claims _____ are subject to restriction or election requirement.

Application Papers

☐ See the attached Notice of Draftsperson's Patent Drawing Review, PTO-948.

☒ The drawing(s) filed on Jun 26, 1999 is/are objected to by the Examiner.

☐ The proposed drawing correction, filed on _____ is ☐ approved ☐ disapproved.

☐ The specification is objected to by the Examiner.

☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119

☐ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).

☐ All ☐ Some* ☐ None of the CERTIFIED copies of the priority documents have been
☐ received.

☐ received in Application No. (Series Code/Serial Number) _____.

☐ received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

*Certified copies not received: _____

☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

Attachment(s)

☐ Notice of References Cited, PTO-892

☐ Information Disclosure Statement(s), PTO-1449, Paper No(s). _____

☐ Interview Summary, PTO-413

☐ Notice of Draftsperson's Patent Drawing Review, PTO-948

☐ Notice of Informal Patent Application, PTO-152

--- SEE OFFICE ACTION ON THE FOLLOWING PAGES ---

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DETAILED ACTION

Drawings

The drawings are objected to because figure 4 cannot be read. Correction is required.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless --

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-6 are rejected under 35 U.S.C. 102(b) as being anticipated by West et al

(5,324,877).

West discloses a liquid-phase^{step d of claim 1} process of transalkylating polyalkylated aromatic components, such as diethylbenzene^{step b of claim 1, claim 4, and claim 5} with benzene^{step c of claim 1} in the presence of a typical Y-zeolite having^{step a of claim 1, claim 2, and claim 3} a surface area of at least 350m²/gram, a pore size of greater than 7 angstroms, and a silica/alumina of 3 to 6 in a transalkylation zone to produce mono-alkyl benzene, such as ethylbenzene^{step d of claim 1} (the abstract; col. 5, line 54 through col. 6, line 5; col. 12, lines 21-26).

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Since the applicants' claimed ranges of silica/alumina ratio, pore size, and surface area are overlapped with the ranges disclosed by West as discussed above, the applicants' claimed invention as called for in claims 1-6 is anticipated by West.

West also discloses in figure 1 that the transalkylation product is recovered as called for in step e of claim 1.

Regarding claim 6, figure 1 of the patent to West shows that transalkylation product stream 62 is separated in separation columns 36, 42, and 48, and that polyethylbenzene being unreacted in the transalkylation process, if present, is recycled to transalkylation zone 60.

As discussed above, West clearly anticipate the invention as called for in claims 1-6.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 148 USPQ 459, that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.

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4. Considering objective evidence present in the application indicating obviousness or unobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(f) or (g) prior art under 35 U.S.C. 103(a).

Claims 1-6 are rejected under 35 U.S.C. 103(a) as being unpatentable over West et al (5,324,877).

West discloses a liquid-phase^{step d of claim 1} process of transalkylating polyalkylated aromatic components, such as diethylbenzene^{step b of claim 1, claim 4, and claim 5} with benzene^{step c of claim 1} in the presence of a typical Y-zeolite having^{step a of claim 1, claim 2, and claim 3} a surface area of 350m²/gram, a pore size of greater than 7 angstroms, and a silica/alumina of 3 to 6 in a transalkylation zone to produce mono-alkyl benzene, such as ethylbenzene^{step d of claim 1} (the abstract; col. 5, line 54 through col. 6, line 5; col. 12, lines 21-26).

Except the surface area and the silica/alumina ratio, West does not *specifically* disclose using a Y-zeolite having a specific range of pore size of greater than 7 and up to about 8

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angstroms (see the whole patent to West). Instead, West discloses a broad range of pore size of greater than 7 angstroms (col. 4, lines 1-2).

Therefore, the examiner's position is that it would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the West process by using a Y-zeolite having a pore size ranging from 7 to 8 angstroms since it is expected that any Y-zeolite having pore size of greater than 7 Angstroms, such as 7 to about 8 angstroms would be expected to yield similar results when compared with a zeolite having the same outside the range of from 8.2 to infinitive.

West also discloses in figure 1 that the transalkylation product is recovered as called for in step e of claim 1.

Regarding claim 6, figure 1 of the patent to West shows that transalkylation product stream 62 is separated in separation columns 36, 42, and 48, and that polyethylbenzene being unreacted in the transalkylation process, if present, is recycled to transalkylation zone 60.

As discussed above, West clearly anticipate the invention as called for in claims 1-6.

Claims 7-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over West et al (5,324,877) alone, alternatively in view of either the admitted prior art (as disclosed by applicants in the specification).

West et al disclose a transalkylation process as discussed by the examiner in the above 102 rejection of claims 1-6 over West et al (5,324,877).

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West discloses that the transalkylation process is operated by reacting unreacted benzene and polyalkylated benzenes recovered from an up-stream alkylation effluent produced by alkylating benzene with ethylene^{step a of claim 7, claim 8, and claim 9} in an alkylation zone containing a molecular sieve, such as Y-zeolite, and silicalite^{steps a and b of claim 7} (the abstract; figure 1, col. 3, lines 34-56; col. 10, lines 27 through col. 13, line 10).

West does not disclose that the average pore size of silicalite is **less than** the average pore size of Y-zeolite^{step a of claim 7}. However, applicants disclose **so** on page 3, lines 9-14 in the specification of this application.

West does not **specifically** disclose using a molecular sieve having a smaller pore size than Y-zeolite for the alkylation process. However, applicants admits that “the molecular sieves employed in the separate alkylation and transalkylation reactors can be the same or different . . . it is often the practice to employ a relatively small to intermediate pore size molecular sieve . . . in the alkylation reactor and follow this with a molecular sieve having somewhat larger pore size . . .”.

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the West process by operating the alkylation process in the presence of a molecular sieve having smaller pore size, such as silicalite and operating the transalkylation process in the presence of a larger pore size, such as Y-zeolite to arrive at the applicants' claimed process as called for in claim 7, namely step (a) since this selection of catalysts

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for alkylation and transalkylation processes in an alkylation-and-transalkylation-process is often practiced in the industry as admitted by applicants.

The limitation of step c of claim 7 can be found in figure 1 of the patent to West.

Claims 10-13, and 18-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over West et al (5,324,877) in view of the admitted prior art (as disclosed by applicants in the specification) further in view of Butler (EP 467,007).

West discloses a process as discussed by the examiner in the 102 rejection and 103 rejection above.

West does not disclose further that the alkylation process is operated in the gas-phase in a *multistage* alkylation reaction zone having a plurality of series catalyst beds (see the whole patent to West). However, Butler et al disclose a substantially the same process as the West process in which the alkylation of benzene with ethylene in the presence of silicalite or ZSM-5 molecular sieve is carried out in the *gas* phase in a *multistage* alkylation reaction zone having a plurality of series catalyst beds^{steps a and c of claims 10 and 18} (the abstract; page 7, lines 45-59).

It would have been obvious to one having ordinary skill in the art at the time invention was made to have modified the West process by operating the alkylation process in the *gas* phase and by using a *multistage* alkylation reaction zone having a plurality of series catalyst beds if a silicalite or ZSM-5 zeolite is used for the alkylation process since Butler discloses that "the

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alkylation step can be conducted as a vapor-phase reaction employing a catalyst such as silicalite or ZSM-5. It is known that silicalite or ZSM-5 is a pentasil zeolite^{step a of claim 18}.

West discloses recycling unreacted benzene to alkylation reaction zone 24^{step f of claims 10 and 18} through lines 38, 16, 14, and 22.

Other limitations recited in steps of claims 10, 18, dependent claims 11-13, and 19-20 which are not mentioned in this rejection have already been discussed fully in the 102 or 103 rejection above.

Double Patenting

The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

Claims 1-13 and 15-21 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-20 of U.S. Patent No. 5,955,642 in view of West et al (5,324,877).

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Claims 1-20 of the conflicting patent disclose substantially the same process as the applicants' claimed process (see claims 1-20 of the conflicting patent).

The difference between the conflicting process and the applicants' claimed process is that claims 1-20 of the conflicting patent do not disclose (1) the pore size of the transalkylation Y-zeolite (see claims 1-20 of the conflicting patent), (2) the pore size of the Y zeolite is larger than the pore size of the silicalite. However, as discussed above, West discloses using a Y-zeolite having a pore size of 350 m²/g for transalkylation process (col. 5, line 54 through col. 6, line 5), and applicants admitted that the pore size of Y-zeolite is larger than the pore size of silicalite (page 3, lines 9-14 of the specification of this application).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the process as called for in claims 1-20 of the conflicting patent by employing the West Y-zeolite in the place of the Y-zeolite transalkylation catalyst in the conflicting process to arrive at the applicants' claimed process since the West catalyst has a long-life (the abstract; col. 2, lines 7-10).

Response to Arguments

Applicant's arguments filed on 6/5/2000 have been fully considered but they are not persuasive.

The argument that West discloses the use of a Y-zeolite having a much greater surface area between 500-700 m²/g and a silica/alumina above 4.5 minimum is not persuasive since West

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discloses that the Y-zeolite has a surface area of at least 350 m²/g which is overlapped with the applicants' claimed broad range of 500 m²/g down to zero. Note that a silica/alumina of 4.5 still lies in the applicants' claimed range of 2-5.

The argument that West does not disclose using Y-zeolite for transalkylation and another zeolite, namely silicalite for the alkylation is not persuasive since West discloses that silicalite can be used as an alkylation catalyst (see the abstract; col. 3, lines 34-56, namely 56). Although West does not disclose specifically using a Y-zeolite for transalkylation and a silicalite for the alkylation, one having ordinary skill in the art appears to recognize as disclosed by the applicants in the specification of this application on page 3, lines 9-14, that it is often the practice to employ silicalite in the alkylation reactor followed by a Y-zeolite for transalkylation zone.

The argument that regarding the Double patenting rejection over conflicting patent 5,324,877, the claimed subject matter of the '642 patent does not require the specific zeolite-Y transalkylation catalyst and the combination of the process of the conflicting patent claims with the West Y-zeolite is a hindsight reconstruction is not persuasive since as discussed in the above rejection, the West Y-zeolite transalkylation catalyst has a long life (the abstract; col. 2, lines 7-10), further the transalkylation process of the conflicting patent claims requires Y-zeolite having a larger pore than the same of the alkylation silicalite zeolite.

In response to applicant's argument that the examiner's conclusion of obviousness is based upon improper hindsight reasoning, it must be recognized that any judgment on obviousness is in a sense necessarily a reconstruction based upon hindsight reasoning. But so long as it takes into

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account only knowledge which was within the level of ordinary skill at the time the claimed invention was made, and does not include knowledge gleaned only from the applicant's disclosure, such a reconstruction is proper. See *In re McLaughlin*, 443 F.2d 1392, 170 USPQ 209 (CCPA 1971).

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for response to this final action is set to expire THREE MONTHS from the date of this action. In the event a first response is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event will the statutory period for response expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communication from the examiner should be directed to Thuan Dang, whose telephone number is (703) 305-2658. The examiner can normally be reached on Monday-Thursday from 7:15 AM to 5:45 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Marian Knode, can be reached on (703) 308-4311. The fax phone number for this Group is (703) 305-3599.

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Any inquiry of a general nature or relating to the status of this application should be directed to the Group receptionist whose telephone number is (703) 308-0661.

T. Dang/TD
August 24, 2000
92329502.2nd

TD

Marian C. Knode

MARIAN C. KNODE
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 1700